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*The Anatomy of Plants: with an Idea of a Philosophical History of Plants: and several other Lectures, read before the Royal Society by Nehemiah Grew M. D. Fellow of the Royal Society, and of the College of Physicians. Printed by WWilliam Rawlins for the Author, 1682.*

**T**HIS *Work* was begun, about Nineteen years past; since then, hath been carried on by the special Appointment of the *Royal Society*; and by their order, is now made publick.

The *Idea*, prefixed to the *Anatomy*, gives us an account of the *Materials* and *Methods* necessary for making a compleat *History* of *Plants*; which are copiously proposed under these five General Heads of Enquiry: *viz.* First, Of those Things, which are of more External consideration about *Plants*, as their *Figures* &c. Secondly, Of their Compounding Parts, as *Vessels* &c. Thirdly, Of their *Liquors* and other Contents. Fourthly, Of their Principles, as *Salts* &c. Fifthly, Of their Aliment, as *Water* and other means of Growth. Aiming, chiefly, at the discovery of the reason of *Vegetation*, and of the Virtues of *Plants*.

The *Anatomy* is divided into four *Books*. In the First, all the *Observations*, except one or two, are made with  
the

the naked Eye. To the End, a Proof might first be given, How far it is possible for us to go without the help of *Glasses*; which many Ingenious men want; and more, the *patience* to manage them. It begins with the *Seed* sow'n, and so proceeds to the *Root, Trunk, Branch, Leaf, Flower, Fruit*, and lastly to the *Seed* also to be sow'n again; for each, allowing one whole *Chapter*. In every *Chapter*, the *Anatomy* of the *Part* being first given; the *Uses* are subjoyned. And there being two *Chapters* for the *seed*; in the first is shewed the manner of its *Growth*; and in the last, the manner of its *Generation*.

The *Second Book*, is divided into Two *Parts*. The First, containeth the *Anatomy* of *Roots*: which is here prosecuted both with the *naked Eye*, and with the *Microscope*. It begins with some special Remarks of the *Motions* and some other properties of *Roots*. Next, proceeds to the *Anatomy* of the *Skin, Bark, Wood, and Pith*: giving the Description of several sorts of *Sap-Vessels*; as also of the *Air-Vessels* or *Lungs*; and of the *Bladders* and *Fibres* of the *Pith* and all the *Parenchymous* parts of a *Plant*; and shewing the elegant and accurate Work of Nature in all. Particularly, that the *Pith* is a *Rete mirabile*; herein more curious, than that in the *Braine*; in that its *Fibres*, are not only exquisitely small, very regularly composed together.

The *Second Part*, gives a large account of the *Vegetation* of *Roots*: shewing, how the ground is prepared for it; How the *Sap* Imbib'd, and distributed to the several *Parts*; How the several *Parts* are nourished; How they are Formed; and how they come to be situate or dispos'd. How *Roots* obtain their different size and shape; How their different *Motion*; and different *Age*: How the Contents of the several *parts* are made; and how their *Odors, Colors, and Tasts*. And what is here said, is also applicable to the same *Parts* in the *Trunk* &c.

The *Third Book*, is also divided into Two *Parts*. The First,

First, containeth the *Anatomy* of *Trunks* and *Branches*, which is here prosecuted in like manner, as the former of *Roots*. Further shewing, the admirable Artifice of *Nature*, in the Structure and Composition of all the *Parts* of a *Plant*. As amongst others, in *Tab. 36, 37, 38, 39, and 40.* In *Tab. 29. f. 1, 2, 3*; the *Vessels* are represented above six hundred thousand times bigger, than they appear to the naked Eye; the structure whereof, cannot be discerned, without being magnified to that degree.

The *Second Part* (omitting what is said of the Vegetation of *Roots*, and is thence applicable unto *Trunks*) consisteth on the further clearing of these following particulars; *viz.* The motion and course of the *Sap*; The motion and course of the *Air*; The Structure of the *Parts*; The Generation of *Liquors*; The Figuration of *Trunks*; The motion of *Trunks*; and their *Nature*, as fitted for *Mechanical Use*.

The *Fourth Book*, is divided into four *Parts*. The First, of *Leaves*. In which, are described, first, their Protections and Folds; Then, those things which appear upon their Surface; The apparent Position of their *Fibres*, and the Measures of their Circumference, defined by the *Arches* of several *Circles*, having the same or divers centres and diametres, and the length of the *Leaf*, or certain equal parts thereof subtracted or multiply'd, being the *Standard* for the diametres of those *Circles*. Next the *Apertures*, *Parts*, and curious *Texture* of *Leaves*; and the Time, and manner in which they are formed. Where the *Author* designs an ascent to the highest step in the business of *Generation*.

The *Second Part*, of *Flowers*. In which, are described the three General Parts of the *Flower*; *viz.* the *Empa'ement*; the *Foliature*; and the *Attire*, both the *Semini* form, and the *Florid*, in which there is a great deal of curious and unexpected Variety; which *Nature* hath bestow'd upon these *Parts*, next to the *Seed* it self, of greatest

est use. For every *Plant* being ἀρρενόθιλος the *Attire*, answers to the *Genitals* of *Male* and *Female* both together; and the *Powder* which they disburse let fall upon the *Uterus*, is the *Sperme* of *Plants*. The *Time* also, in which the *Flower* is form'd, is observed, not to be the same *Year* in which it appears, as hath hitherto been thought, but the year before.

Hereto is subjoyned an *Appendix*; being a *Method* proposed for the ready finding, by the *Leaf* and *Flower*, to what sort any *Plant* belongeth.

The *Third Part*, of *Fruits*. In which are described these following, viz. an *Apple*, *Lemon*, *Cucumber*, *Pear*, *Plum*, *Grape*, *Goosberry*, and some others; which are so many several sorts of the *Fleshy Uterus*. Next, of the *Seed-case* or *Membranous Uterus*. And lastly, the *Use* of the several *Parts*, both to the *Fruit* and *Seed*, is set down. Particularly, the manner of the *Ejaculation* of the *Seed* in *Noli-me-tangere*.

The *Last Part*, of *Seeds*. Wherein we have first, a *Description* of the *Various* and *Elegant Figures* of *Seeds*. Next, an account of their *Number*, and several *Motions*, and for what purpose they are made. As for instance, in the *Seed* of *Harts Tongue* and all that *Tribe*, which are shot off with a spring contrived for it. The annual product of these *Seeds* from one *Plant*, being about a *Million*; of which, ten Thousand, are not so big as a white *Pepper Corn*. After this, the *Description* and *Use* of the *Covers* of the *Seed*, and of the *Vitellum*; Of the several *Parts* of the *Fætus* or true *Seed*; and lastly, a further account of the rare contrivance of the *Stone* in *Fruits*, and of the three *Membranes* over the *Seed*, in order to the *Generation* and growth of the same. Thus far the *Anatomy*.

The following *Lectures* are these.

I. Of the *Nature*, *Causes*, and *Power* of *Mixture*. In discourse whereof, a *Foundation* is laid for these *Axioms*, Sc. That the whole business of the *Material World*, is nothing

nothing else but *Mixture*. That Natural and Artificial *Mixture* are the same, as also the *Causes* of both. And that therefore, so far as we can govern *Mixture*, we may do what Nature doth. As in rendering all *Bodies* sociable or mingleable; In making Artificial Bodies in imitation of those of *Natures* own production; and other particulars, of which Instances are given. In a short *Appendix* to this Discourse, notice is taken of Mr. *Pappins New Digest*; and how directly it is deducible from one of those *Rules* laid down in the fifth *Chapter* (Section the fifth) for the *Mixture* and *Dissolution* of *Bodies*.

II. *Experiments* in *Consort*, of the *Lustation* arising from the *Mixture* of several *Menstruum's* with all sorts of *Bodies*. Being a *Specimen* of a *Natural History* of the *Materia Medica*.

III. An *Essay*, of the various Proportions, wherein the *Lixivial Salt* is found in *Plants*.

IV. A Discourse concerning the *Essential* and *Marine* or *Muriatick Salts* of *Plants*. In which is shewed the way of making the same.

V. A Discourse of the *Colours* of *Plants*.

VI. A Discourse of the Diversities and Causes of *Tastes*, chiefly in *Plants*. With an *Appendix* containing some observables of the *Odors* of *Plants*.

VII. *Experiments* in *Consort* upon the Solution of of *Salts* in *Water*. From whence, (amongst other *Inferences* of import in relation to *Natural Philosophy*) the Cause of the *Motion* of the *Mercury* in the *Barometre*, is assign'd.

The *Plates* to this *Work*, are fourscore and three, all upon *Sheets* and half *Sheets*.

*Excerpta ex literis Ill. & Clariss. Virorum  
ad Nob. Ampliss. & consultiss. D.  
Joh. Hevelium Cons. Gedanensem  
perscriptis, Judicia de Rebus Astro-  
nomicis, ejusdemque Scriptis, exhiben-  
tia, studio ac operâ Johannis Erici Ol-  
hoffij Secretarij Gedani Anno 1683 4<sup>o</sup>.*

THE Compiler of this Book being now Secretary of the Republic of Dantzic, has happily chosen a Subject which gives him Opportunity to publish the extraordinary merit of his friend, the famous and learned *Hevelius*; and at the same time to advance the Reputation of his Country, where such men have been bred up, and called to be *Magistrates*. The Work it self consists but of a part of Fifteen Volumes of Letters, written by some of the chiefest men of this Age, to *Hevelius* in Commendation of his *Selenography*, *Cometography* and *Machina Cælestis*, already published, and for his further encouragement to go on with his other *Astronomical* designs, yet unfinished. The *Encomiums* given in these Letters are greater then can be comprehended by those that have not read them, and are to be valued by the worth and honour of those persons they come from, among whom the Great *Monsieur Colbert* deserves well to be mentioned, the Sincerity of whose Praises need not be doubted of, since they came accompanied with good Solid Bills of Exchange.

*Traçtatus*

*Tractatus de Podagra & Hydrope per Tho Sydenham*  
*M. D. Londini 1633.*

**T**He account this Treatise gives us of the *Gout* is grounded upon the Author's many Years experience, both of the disease it self, and of the method of cure. He is very exact in his description of the rise, progress, causes and Symptoms of it, and tells us those men are most commonly attacked by it in their age, whose Youth was pampered with spirituous VVines, and high Diet, whom though they perceived no inconveniences but what their exercises then carried off, yet the necessary unactiveness of old age made them suffer what an active and vigorous Youth permitted them not to feel. Not that the young or the lean are totally exempt from it, inheritance and excess of *Vener*y often bringing it upon those whose years and constitution might else have been privileged, and among all mankind he observes those most liable and made for it, whose large heads, and moist, lax, and full habit of body marks them out, and disposes for its reception. But if any man is so happy as to escape it till he is old, he is never so often or so much afflicted, as he who is seized in his youth, either death preventing the full growth of the disease, or the native heat being not strong enough to through off the *materia morbifica* upon the joints. The regular time of its invasion he assigns the latter end of *January*, or the beginning of *February*, the chief time of its fury is at night, with which the pain proportionably declines, a series of which short Fits constitute the general one, which sometimes lasts two or three Months, and those who are in years, or weakened by other Distempers it seldom leaves till the full Summer drives it away.

Among the other sad attendants of this distemper he brings in the *Stone*, which happens to most either from their long lying on their backs, or from the intermission of the usual *secretions*, or else because both distempers may probably spring from one and the same matter.

Neither is the body alone thus afflicted, but the torments reach the mind, so that every *Paroxysm* is as much a fit of Anger, as of the *Gout*. upon contemplation of all the *Symptomes* he imputes the whole distemper to the *defect of concoction*, in the parts and humours of the body, which the want of animal spirits many other ways formerly wasted, necessarily infers, by the great decay of the *ferments*, whose force depends chiefly upon them.

As for the cure he designs antecedently the digestion of the humours, and in the Fit the alloying of the heat, and *Ebullition* of them  
 arising



arising from their putrefaction ; to the great opposition of which intentions he attributes the great difficulty commonly met with in endeavouring to remove this Distemper.

The *Dropsie* he makes universal extending to all ages and Sexes, though women are more liable to it than men, and are most commonly exposed to it either when they are barren, or when age hath rendered them incapable of Child-bearing. The true Symptoms of it are difficulty of breathing, little Urine and much thirst, the consumption of the other parts likewise in proportion to the encrease of the *Hydropical* constantly happens. The general cause he supposes the *weakness* of the *blood*, which not being able to assimilate the *Chyle*, lets it fall into the pendulous parts of the Body, till at last it enters the Abdomen, where while the quantity of it is small, nature forms little bladders to contain it, till at last exceeding all measure, it knows no bounds but those of the *Peritonæum*. The causes which weaken the blood he takes to be the excess of *Venesectiō*, or of any other Evacuation, any long distemper, or a constant abuse of spirituous drinks. His indications are to evacuate the water, and to strengthen the blood, for both which he gives particular directions, and among his remedies these two especially he commends, viz, *Elaterium*, and *Crocus metallorum*.

Discoursing of the hidden conveyances nature carries of these waters by, he infers the great use of *Anatomy* in *Physick*, as being that, without which it is impossible to form clear *Ideas* either of the nature or causes of the diseases ; And does not in the least doubt the success of his method, unless the *viscera* by long lying in the waters are corrupted. He does not much commend the *Paracentesis* or the *Acupunctura*, they being as likely to cause a *Gangrene* as *Blisters* themselves, by the way he takes notice of the burning with *Moxa*, which he will not allow to have a *Specifick* quality in its flame, any more than another actual fire, and although we owe this Medicine to the *Indians*, yet it was not unknown to the *Antients*, for *Hippocrates* directs cauterising with raw Flax in the very case of the *Gout*.

## OXFORD,

Printed by LEONARD LICHFIELD, Printer  
to the University, and are to be sold by Moses Pitt at the  
*Angel*, and Richard Chiswel at the *Rose and Crown*  
in *St. Pauls Church-yard*, Hen. Rogers at the Sign  
of the *Bible* in *Westminster Hall*, and Sam. Smith  
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